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ABSTRACT

This chapter reviews school-based drug abuse prevention curricula. Drawing on the most current research, the chapter identifies key elements of effective prevention curricula, noting that programs should (1) reflect proven prevention theory and research; (2) provide developmentally appropriate information about tobacco, alcohol and drugs; (3) use interactive teaching techniques, which are most effective at promoting skill development; (4) provide adequate coverage and sufficient follow-up; (5) be culturally sensitive; (6) provide teach training and support; (7) realize additional components may enhance program effectiveness; and (8) demonstrate their effects in rigorous evaluation. The chapter presents an analysis of the 46 most widely available drug abuse prevention curricula for relative effectiveness; and includes suggestions of various ways to improve program design and implementation. The chapter concludes with three policy recommendations for Healthy People 2010 designed to make effective prevention an integral part of adolescent education: (1) all drug prevention curricula should be assessed to determine the extent to which each curriculum addresses the key elements of effective prevention; (2) all drug education curricula should be rigorously evaluated using pretest-posttest control group designs with measures of substance use behavior; and (3) drug prevention curricula demonstrated to be effective in research should be aggressively promoted. (Contains 70 references.) (SD)

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School-Based Drug Abuse Prevention Strategies: From Research to Policy and Practice

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This chapter reviews school-based drug abuse prevention and proposes new directions for prevention research that will move toward the goals of *Healthy People 2000* (U.S. Department of Health and Human Services, Public Health Service [DHHS], 1991, 1995). Drawing on the most current research, we identify key ingredients of successful prevention programs, analyze the 46 most widely available drug abuse prevention curricula for relative effectiveness, and suggest various ways to improve program design and implementation. We conclude with policy recommendations for *Healthy People 2010* designed to make effective prevention an integral part of adolescent education.

Healthy People 2000 Objectives for Youth

The *Healthy People 2000* (DHHS, 1991) objectives include prevention of tobacco, alcohol, and drug use as well as treatment,

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reduction of alcohol-related traffic accidents, and increased regulation of tobacco and alcohol advertising. Specific objectives targeting youth include the following:

3.5. Reduce the initiation of cigarette smoking by children and youth so that no more than 15% have become regular cigarette smokers by age 20.

3.9. Reduce smokeless tobacco use by males aged 12 through 24 to a prevalence of no more than 4%.

4.1b. Reduce deaths among people aged 15 to 24 caused by alcohol-related motor vehicle crashes to no more than 18 per 100,000.

4.5. Increase by at least 1 year the average age of first use of cigarettes, alcohol, and marijuana for ages 12 through 17 (Baseline: Age 11.6 for cigarettes, age 13.1 for alcohol, and age 13.4 for marijuana in 1988).

4.6. Reduce the proportion of young people who have used alcohol, marijuana, and cocaine in the past month as follows:

Substance/Age	*Baseline 1988*	*Target 2000*
Alcohol/ages 12-17	25.2%	12.6%
Alcohol/ages 18-20	57.9%	29.0%
Marijuana/ages 12-17	6.4%	3.2%
Marijuana/ages 18-25	15.5%	7.8%
Cocaine/ages 12-17	1.1%	0.6%
Cocaine/ages 18-25	4.5%	2.3%

4.7. Reduce the proportion of high school seniors and college students engaging in recent occasions of heavy drinking of alcoholic beverages to no more than 28% of high school seniors and 32% of college students.

4.8. Reduce alcohol consumption by people aged 14 and older to an annual average of no more than 2 gallons of ethanol per person.

4.9. Increase the proportion of high school seniors who perceive social disapproval associated with the heavy use of alcohol, occasional use of marijuana, and experimentation with cocaine, as follows:

Behavior	*Baseline 1989*	*Target 2000*
Heavy use of alcohol	56.4%	70%
Occasional use of marijuana	71.1%	85%
Trying cocaine once or twice	88.9%	95%

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4.10. Increase the proportion of high school seniors who associated risk of physical or psychological harm with the heavy use of alcohol, regular use of marijuana, and experimentation with cocaine, as follows:

Behavior	*Baseline 1989*	*Target 2000*
Heavy use alcohol	44.0%	70%
Regular use of marijuana	77.5%	90%
Trying cocaine once or twice	54.9%	80%

4.11. Reduce to no more than 3% the proportion of male high school seniors who use anabolic steroids. (pp. 144-147, 164-175)

A primary service objective of *Healthy People 2000* relating to youth is to provide children with tobacco, alcohol, and drug prevention curricula as part of quality school comprehensive health education. Comprehensive health education is a broad spectrum approach that provides a variety of school-based programs and services to promote general competence as well as mental, physical, and social health (Weissberg & Elias, 1993).

There are sound empirical reasons for providing drug abuse prevention as part of a comprehensive approach to health education as opposed to discrete programs that focus on a single risk behavior (e.g., smoking *or* drug use *or* premature sexual behavior). Strong intercorrelations have been observed for different types of substance use (e.g., smoking, drinking, and drug use) as well as between different types of health-compromising behaviors (e.g., substance use and premature sexual behavior). In addition, these behaviors have been observed to correlate with psychosocial risk factors, which include environmental as well as personality variables, suggesting a common underlying cause (Jessor & Jessor, 1977). Finally, these behaviors appear to be moderated by common prevention strategies (resistance skills training).

There are also good policy reasons for providing drug abuse prevention as part of comprehensive health education. Increasing demands on class time make it difficult for teachers to add discrete programs to their class time. Discrete programs also are less likely than comprehensive programs to be maintained by a school (Johnson, MacKinnon, & Pentz, 1996).

Progress Toward Reaching *Healthy People 2000* Goals for Youth

A major accomplishment noted in the midcourse review was that declining death rates among 15- to 24-year-olds in alcohol-related traffic fatalities had already reached the *Healthy People 2000* objectives (Fleming, 1996). This objective therefore was revised to make it more challenging.

The National Household Survey on Drug Abuse (DHHS, 1993) suggests that there may have been some progress toward meeting the goals concerning average age of initiation for marijuana, although retrospective data from the Monitoring the Future Study (National Institute on Drug Abuse [NIDA], 1991-1996) are not consistent with this finding. According to the National Household Survey, the average age of initiation for marijuana has increased since 1988, with the most dramatic increase occurring between 1992 and 1993; at 13.9 years in 1993, it was halfway to the targeted 2000 objectives of 14.4 years. In contrast, according to the Monitoring the Future Survey, in 1995, 5.3% of 8th graders reported that they had used marijuana by the 6th grade, compared with 2.4% of 10th graders.

Unfortunately, little progress has been made toward increasing the average age of initiation for tobacco use or alcohol use, which remain well below their 2000 targets (Fleming, 1996). Initiation of tobacco use has remained fairly stable in the National Household Survey at around 11.7 years since 1988 (it was 11.6 in 1988). The average age of initiation for alcohol use, 12.9 in 1993, was slightly lower than the 13.1 years it was in 1988.

Considerable progress has been made in recent years toward some of the other objectives (for example, expanding no-smoking rules within the workplace). The National Household surveys (DHHS, 1993) and Monitoring the Future surveys (Johnston, O'Malley, & Bachman, 1995), however, reveal disturbing trends in adolescent alcohol, tobacco, and drug use, which have been increasing rapidly since 1992. During the same period, beliefs about the risks and disapproval of drug use (which have been shown to be important inhibitors of use) have declined.

The most recent Monitoring the Future survey (NIDA, 1996) revealed that in 1996, cigarette smoking rose for the 5th year in a row for 8th and 10th graders, and for the 4th year in a row for high

school seniors. Since 1991, the proportion of 8th and 10th graders who reported smoking in the past month increased by up to 50% (from 14% to 21% for 8th graders, and from 21% to 30% for 10th graders). Among high school seniors, the proportion of students reporting smoking in the past month increased more than one fifth (from 28% to 34%). Between 1993 and 1995, the proportion of 10th and 12th graders perceiving smoking as harmful has declined significantly (from 61% to 57% among 10th graders, and from 70% to 66% among 12th graders).

Since 1991, the rate of illicit drug use also has increased among 8th, 10th and 12th graders. From 1991 to 1996, the proportion of 8th graders who had used any illicit drug in the past month increased from 5.7% to 14.6%. During the same period, monthly illicit drug use by 10th graders increased from 11.6% to 23.2%, and by 12th graders from 16.4% to 24.6%. Between 1991 and 1996, monthly marijuana use has more than tripled among 8th graders (from 3.2% to 11.3%), more than doubled for 10th graders (from 8.7% to 20.4%) and increased by more than half for 12th graders (from 13.8% to 21.9%).

The rate of alcohol use has tended to be more stable in the past few years, although it remains unacceptably high. In 1996, 26% of 8th graders reported that they have had a drink in the past month, compared with 40% of 10th graders and 51% of seniors. In 1995, the rate of binge drinking (five or more drinks in a row within the past 2 weeks) was 15% for 8th graders, 24% for 10th graders, and 30% for 12th graders.

Data in 1995 show that although the majority of young people still disapprove of using illicit drugs, the intensity of disapproval has grown weaker. For example, disapproval of trying marijuana declined significantly for 8th and 10th graders between 1991 and 1995 (from 85% to 71% among 8th graders and from 75% to 60% among 10th graders).

The proportion of students seeing drug use (including use of marijuana and cocaine) as dangerous has also declined since 1991 for 8th, 10th, and 12th graders. Between 1991 and 1995, there were significant declines in perceived harmfulness of trying marijuana (from 40% to 29% among 8th graders, from 30% to 22% among 10th graders, and from 27% to 16% among 12th graders) and in perceived harmfulness of trying cocaine (from 56% to 45% among 8th graders and from 59% to 54% among 10th graders).

Observed increases in tobacco, alcohol, and drug use across age and ethnic groups are likely the result of influences that extend across U.S. society (NIDA, 1995, 1996). Why have things gotten worse recently? A major influence operating in recent years is waning public and political attention to the problem of drugs, which has resulted in less-balanced messages about alcohol, tobacco, and drugs in the media. Specifically, while the tobacco and alcohol industries spend billions of dollars each year promoting the use of their products with advertising increasingly directed toward young people, and while movies and music videos glamorize the use of alcohol, tobacco, and other drugs, there has been less political attention to and less media coverage of the negative consequences of tobacco, alcohol, and drug use. Waning public and political attention are likely to translate into less attention from parents, who may be less likely today to speak to their children about alcohol, tobacco, and drugs than they were 10 years ago.

Current Prevention Research

A comprehensive review of the published research on school-based drug abuse prevention from 1989 to 1994 provided the basis for identifying key elements in effective drug abuse prevention curricula (Dusenbury & Falco, 1995). In addition to this comprehensive review, wide-ranging interviews were conducted with the following leading prevention experts during 1994.

Dr. Gilbert J. Botvin, Director of the Institute of Prevention Research, Cornell University Medical College

Dr. Richard Clayton, Director of the Center for Prevention Research, University of Kentucky

Dr. Phyllis Ellickson, Senior Behavioral Scientist and Resident Scholar at RAND

Dr. Susan Ennett, Research Health Analyst at the Center for Social Research and Policy Analysis at the Research Triangle Institute

Dr. Brian Flay, Director of the Prevention Research Center at the University of Illinois at Chicago

Dr. William B. Hansen, Associate Professor at Bowman Gray Medical College

Dr. J. David Hawkins, Director of the Social Development Research Group at the University of Washington

Dr. Karol Kumpfer, Associate Professor in the Department of Health Education at the University of Utah

Dr. Joel Moskowitz, Associate Director of the Center for Family and Community Health at the University of California at Berkeley

Dr. Mary Ann Pentz, Associate Professor of Research, Institute for Health Promotion and Disease Prevention Research at the University of Southern California

Dr. Cheryl Perry, Professor in the Division of Epidemiology, School of Public Health at the University of Minnesota

Dr. Christopher Ringwalt, Research Health Analyst at the Center for Social Research and Policy Analysis at the Research Triangle Institute

Dr. Steven Schinke, Professor at the School of Social Work, Columbia University

Dr. Nancy Tobler, Research Associate Professor, School of Social Welfare, State University of New York in Albany

Dr. Roger Weissberg, Professor in the Department of Psychology at the University of Illinois at Chicago

The lengthy telephone interviews (30 to 60 minutes) were organized around two basic questions: "What do you think we currently know about what works in drug abuse prevention?" and "What would you say we know about the effective ingredients of drug abuse prevention programs?" Experts also were asked specific questions relating to their own research.

General Findings

Several recent literature reviews (Botvin & Botvin, 1992; Hansen, 1992, 1993; Mrazek & Haggerty, 1994; Perry & Kelder, 1992) as well as a series of meta-analyses (Bangert-Drowns, 1988; Bruvold, 1990, 1993; Bruvold & Rundall, 1988; Hansen, Rose, & Dryfoos, 1993; Rundall & Bruvold, 1988; Tobler, 1992, 1994, in press) conclude that certain types of school-based programs can achieve measurable reductions in adolescent drug use. There is also general agreement that some prevention programs are not effective, particularly those designed to increase knowledge about drugs rather than to change behavior (Botvin & Botvin, 1992).

Evaluations of drug abuse prevention programs have become increasingly rigorous in the past decade, with larger samples, longer follow-up periods, more complex research designs, and more thorough data analyses, as well as greater concern for implementation fidelity and the accuracy of assessment measures. Recently published studies are impressive in their size, scope, and methodological sophistication and for the replicability and consistency of findings across different research groups (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995; Botvin, Baker, Dusenbury, Tortu, & Botvin, 1990; Ellickson & Bell, 1990; Pentz et al., 1989; Pentz et al., 1990; Shope, Kloska, Dielman, & Maharg, 1994). Most important, these studies show that measurable reductions in adolescent drug, alcohol, and tobacco use can be sustained through high school and into young adulthood.

Specifically, M. A. Pentz (personal communication, 1994) and her colleagues at the University of Southern California and Botvin et al. (1995) at Cornell University Medical College have found persistence of behavioral effects 6 years after program administration. Although previous studies showed reductions in initial smoking, drinking, and marijuana use, these long-term follow-ups demonstrate an impact on other illicit drug use, as well. Pentz reports effects on stimulant use, including cocaine, whereas Botvin found effects on use of hashish, heroin, PCP, and inhalants, but not cocaine.

In addition, the follow-up by M. A. Pentz (personal communication, 1994) and her colleagues found less need for drug treatment among young adults who had participated in the drug abuse prevention program during junior high. G. J. Botvin (personal communication, 1994) and his colleagues found a reduction in risky driving among young people 6 years after participating in the drug abuse prevention program.

Key Elements of Effective Prevention Curricula

The research literature, as well as expert opinion, suggests that the following elements are critical for effective drug prevention curricula (Dusenbury & Falco, 1995).

1. *Programs should reflect proved prevention theory and research.* At present, the most effective curricula are based on three major theoretical approaches: social learning theory (Bandura, 1977), normative expectancy theory (Ajzen & Fishbein, 1980), and adolescent problem behavior theory (Jessor & Jessor, 1977), briefly described below.

A. *Social learning theory.* Behavior is generally learned from observing important role models, particularly as they are rewarded for their actions. Adolescents look to their friends, older peers, and media figures. Curricula based largely on this learning theory are *social resistance skills training programs* (Botvin & Botvin, 1992; Hansen, 1992, 1993; Mrazek & Haggerty, 1994; Perry & Kelder, 1992; Tobler, 1992, 1994, in press) that help young teens recognize influences to use drugs and teach them how to resist while still maintaining their friendships.

B. *Normative expectancy theory.* Normative expectancy theory recognizes the power perceptions about the actions and opinions of others have in shaping behavior. The programs based on normative expectancy theory are called *normative education.* Social resistance skills training programs usually include normative education, which teaches adolescents that drug use is not the norm. Normative education includes activities designed to correct overestimates about the prevalence of smoking, drinking, and drug use and/or activities designed to show adolescents that most peers and adults do not think tobacco, alcohol, and drug use is cool. In an experimental manipulation, Hansen and Graham (1991) found that normative education was a critical ingredient in reducing drug use. Some experts (e.g., W. B. Hansen, personal communication, 1994; J. D. Hawkins, personal communication, 1994) are convinced that normative education is essential to the long-term success of drug abuse prevention programs. G. J. Botvin (personal communication, 1994) and his colleagues, however, found that although normative education is important to drug prevention, it is not sufficient to reduce drug use and that resistance skills training continues to be necessary.

C. *Adolescent problem behavior theory.* Adolescent problem behavior theory views problem behaviors such as drug use, vio-

lence, and premature sexual activity as useful or functional to the adolescent. These behaviors serve a perceived purpose; adolescents may believe these behaviors will help them achieve personal goals such as gaining admission to a peer group, demonstrating independence from parents, or coping with boredom, stress, anxiety, or hopelessness. Programs based on adolescent problem behavior theory provide adolescents with *broader personal and social skills training*. They promote self-esteem and teach adolescents how to set and achieve realistic goals, make competent decisions, cope with stress and anxiety, communicate effectively, make friends, and be assertive. Social resistance skills training and normative education are often done within the context of broader personal and social skills training, and there is evidence that these broader-based programs produce slightly larger reductions in drug use than social resistance training alone (Tobler, in press).

2. *Programs should provide developmentally appropriate information about tobacco, alcohol, and drugs.* Children and adolescents are more interested in concrete information and here-and-now experience than they are in information about possibilities in the far-off future (Mussen, Conger, & Kagan, 1979). Effective curricula contain information about drugs that is accurate and relevant—information that emphasizes short-term and negative social consequences of use. Extensive information about the types and effects of drugs is not necessary and may be counterproductive (G. J. Botvin, personal communication, 1994). Effective prevention programs also recognize the importance of peers and acceptance by peers during adolescence (Lerner, Petersen, & Brooks-Gunn, 1991) and provide adolescents with training in how to make independent decisions and resist peer pressure while maintaining friendships.

3. *Interactive teaching techniques are most effective at promoting skill development.* Social resistance skills approaches and broader personal and social skills training rely on interactive teaching techniques such as discussions, small-group activities, and role playing; unlike more didactic techniques such as lecture, interactive techniques are designed to promote active participation of students

(Bosworth & Sailes, 1993; Tobler, in press). Unfortunately, some teachers are less comfortable using interactive teaching techniques (Bosworth & Sailes, 1993), and these teachers will be less likely to effectively implement promising prevention programs.

4. *Curricula should provide adequate coverage and sufficient follow-up.* Many drug abuse prevention programs tend to be short, with fewer than 10 sessions in the first year and fewer than 5 sessions in the second year. As B. Flay (personal communication, 1994) observed, "Realistically, the interventions we are doing are puny compared to the myriad of other influences kids are exposed to that are ongoing." The brevity of drug abuse prevention interventions may help explain recent findings that prevention effects decay through time (e.g., Bell, Ellickson, & Harrison, 1993). Given the brevity of interventions, none of the experts interviewed were surprised that effects would decay (e.g., B. Flay, personal communication, 1994; J. Moskowitz, personal communication, 1994). A critical element of effective prevention programming, then, is sufficient and continued follow-up.

5. *Programs should be culturally sensitive.* To be successful, drug abuse prevention strategies must be sensitive to the ethnic and cultural backgrounds of the youth they target. Studies by Botvin and his colleagues (Botvin, Batson, et al., 1989; Botvin, Dusenbury, Baker, James-Ortiz, & Kerner, 1989; Botvin, Schinke, Epstein, & Diaz, 1994; Botvin, Schinke, Epstein, Diaz, & Botvin, 1995) suggest that broader-based personal and social training approaches that include social resistance skills training can be adapted to make them more sensitive and appropriate to the experience of African American and Latino youth.

6. *Programs should provide teacher training and support.* Results from a series of studies (Botvin, Baker, Dusenbury, et al., 1990; Ross, Luepker, Nelson, Saavedra, & Hubbard, 1991; Smith, McCormick, Steckler, & McLeroy, 1993) reveal that drug prevention programs are most successful when teachers receive training and support from program developers or prevention experts. Much research remains to be done to determine the optimal length of teacher training, the most effective teacher training strategies, and

the most critical content areas to be covered in teacher training (e.g., the theory behind a prevention program, evaluation studies concerning prevention programs, classroom management issues, and guidelines for using a particular curriculum). A major emphasis of teacher training, however, should be interactive teaching techniques, given their apparent importance in promising prevention curricula (N. Tobler, personal communication, 1995). To help teachers become familiar with and comfortable using interactive teaching techniques, teacher trainers should model these behaviors during training sessions. In addition, teachers should be given ample opportunity to practice these new skills, as well as feedback and reinforcement during practice sessions. Ideally, initial training session should be followed by booster sessions.

7. *Additional components may enhance program effectiveness.* Although much research remains to be done, components designed for the family, the community, the media, and special populations are expected to enhance the effectiveness of drug abuse prevention. For example, large projects by three different research groups (Hawkins, Catalano, & Kent, 1991; Pentz et al., 1989; Pentz et al., 1990; Perry, Kelder, Murray, & Klepp, 1992; Perry et al., 1993) suggest that broadening school-based approaches to include family, community, and the media may be valuable. A definitive study of the relative contribution of additional components to the efficacy of drug abuse prevention curricula, however, has yet to be done. Indeed, the need for research on this issue was highlighted in *Healthy People 2000* (DHHS, 1991), which included a recommendation to test the effectiveness of combined interventions (e.g., school-based programs and mass media) on smoking initiation and determine which intervention elements are effective.

8. *Programs should demonstrate their effects in rigorous evaluation.* An important question for any drug abuse prevention curriculum is whether it can be demonstrated to have an impact on drug use behavior. The quality of evaluation studies must be assessed, as well, to know how confident one can be in the findings. At a minimum, evaluations should include pretest-posttest, control group design, and outcome measures of drug, alcohol, and tobacco use behavior. In addition, to confirm that research studies do not

have serious flaws, they should be published in peer-reviewed journals.

State of the Art in Practice

We recently completed a guide to drug abuse prevention curricula called *Making the Grade* (Drug Strategies, 1996). This guide reviews nationally available classroom-based drug abuse prevention programs, including curriculum materials and research reports of their evaluation, to assist educators in choosing programs that are most likely to be effective and appropriate for their students.

A total of 47 school-based curricula were identified (one program, Me-Me, declined to participate). Of these, 46 were assessed. One program (BABES) did not provide sufficient curriculum material for a complete assessment. See Table 3.1 for a list of these programs.

Of the 46 curricula, 14 are comprehensive health education programs that cover many of the following topics *in addition to drug prevention:* growth and development, disease prevention, nutrition, fitness, dental health, sexuality, AIDS, safety and injury prevention, child abuse, environmental concerns, and consumer health. Because a *Healthy People 2000* goal is to provide prevention education to students, preferably through quality comprehensive health education, these programs are particularly important. Unfortunately, only 3 of the 14 comprehensive curricula have been carefully evaluated. Indeed, a gap continues between the types of comprehensive health education educators are encouraged by policymakers to adopt and the state-of-the-art programs of limited scope and duration that have been evaluated (Weissberg & Elias, 1993).

Of the 46 programs reviewed, 43 include social resistance skills training, and 36 provide training in broader personal and social skills. Despite the importance of normative education, just over half (24) of the programs had well-developed normative education activities.

Most drug abuse prevention curricula currently available have not been evaluated in published, pretest-posttest control group design studies with measures of substance use behavior. Only 10 programs (22%) have been rigorously evaluated using sound research designs. On the basis of these evaluations, eight promising

Table 3.1 Listing of Drug Abuse Prevention Curricula Currently Available

	Grade Level	*Social Resistance Skills Training*	*Broader Personal and Social Skills*	*Normative Education*	*Adequate Evaluation*
Comprehensive Health Programs					
Actions for Health	K-6	X	X		
Comprehensive Health	5-9	X	X	X	
Discover: Decisions for Health	7-12	X	X		
Entering Adulthood	9-12	X	X		
Great Body Shop	K-6	X	X		
Growing Healthy	K-6	X	X		X
Health Skills for Life	K-12	X	X		
Know Your Body	K-6	X	X	X	X
Michigan Model	K-8	X	X	X	
Quest: Skills for Growing	K-5	X	X		
Quest: Skills for Adolescence	6-8	X	X	X	
Quest: Skills for Action	9-12	X	X	X	
Science for Life and Living	K-6	X	X		
Teenage Health Teaching Modules	6-12	X	X	X	X
K-12 Programs					
BABES	P-12	•	•	•	
Choosing for Yourself II	K-12	X	X		
DARE	K-12	X	X	X	X*
Discover Skills for Life	K-12	X	X	X	
Here's Looking at You, 2000	K-12	X	X	X	
Learning About Alcohol and Other Drugs	K-12	X	X	X	
Learning to Live Drug Free	K-12	X	X		
Project Oz	K-12	X	X	X	
That's Life	K-10	X	X		
Elementary and Middle School Programs					
CounterAct	4, 5, or 6	X			
Facts, Feelings, Family and Friends	K-6	X	X	X	
Growing Up Strong	P-6	X	X		
Growing Up Well	K-8	X	X		
I'm Special	3 or 4		X		
McGruff	P-6	X			
Paper People	P-3	X	X		
Positive Action	K-8	X	X	X	
Project Charlie	K-6	X	X		
Starting Early	K-6	X	X		
Middle and High School Programs					
Al-Co-Hol	7-9				
Alcohol Misuse Prevention Program	6-8	X		X	X
Drug Proof	6-8	X	X		
From Peer Pressure to Peer Support	7-12	X	X	X	
Healthy for Life	6-8	X	X	X	
Life Skills Training	6-8 or 7-9	X	X	X	X
Ombudsman	5-9	X	X		
Project Alert	6, 7 or 7, 8	X		X	X*
Project All-Stars	6, 7			X	
Project Northland	6-8	X		X	X
Setting Norms for Refusal	6, 7, or 8	X		X	
Social Competence Promotion Program	5, 6, or 7	X	X	X	X
STAR	5-8	X		X	X
Talking With Your Students About Alcohol	5-12	X		X	

• Insufficient curriculum materials provided to assess program content.
X* Effects disappear over time.

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curricula include the Alcohol Misuse Prevention Program (Dielman, Kloska, Leech, Schulenberg, & Shope, 1992; Dielman, Shope, Leech, & Butchart, 1989; Shope, Dielman, Butchart, Campanelli, & Kloska, 1992), Growing Healthy (Connell & Turner, 1985; Connell, Turner, & Mason, 1985), Know Your Body (Walter, Vaughan, & Wynder, 1989), Life Skills Training (Botvin, Baker, Dusenbury, et al., 1990; Botvin, Baker, Filazzola, & Botvin, 1990; Botvin, Batson, et al., 1989; Botvin, Dusenbury, et al., 1992; Botvin et al., 1994; Botvin, Schinke, et al., 1995), Project Northland (Perry et al., 1996), the Social Competence Promotion Program (Caplan et al., 1992), STAR (Johnson et al., 1990; Pentz et al., 1989), and the Teenage Health Teaching Modules (Errecart et al., 1991). Growing Healthy, Know Your Body, and Teenage Health Teaching Modules are comprehensive health education programs. In addition, two programs have been rigorously evaluated, although long-term studies suggest that effects of these programs disappear over time: DARE (Clayton, Cattarello, & Walden, 1991; Ennett, Rosenbaum, et al., 1994; Harmon, 1993; Ringwalt, Ennett, & Holt, 1991) and Project Alert (Bell et al., 1993; Ellickson & Bell, 1990; Ellickson, Bell, & McGuigan, 1993). Results of the evaluations of these programs are summarized below.

These summaries report the number of studies that have evaluated each program, the number of students included in each evaluation, and outcome results in tobacco, alcohol, and drug use behavior. We have elected, where possible, to present results in percentage reductions of substance use. There is no standard way of presenting data in drug abuse prevention evaluations. Although it might be more appropriate to report an effect size for each study because an effect size standardizes the data, researchers do not always report the standard deviation of the control group, making it impossible to calculate effect sizes for every study. Moreover, because studies are often 5 or more years old, it is not an easy matter for many researchers to locate that information when asked.

The summaries also report the proportion of minority youth in each sample because relatively few studies have included significant samples of minority youth. Given space limitations, the summaries do not report findings relating to attitudes, intentions, other mediating variables, or implementation fidelity. For information concerning these issues, or for additional detail, the reader is referred to the original studies cited below.

Alcohol Misuse Prevention Project

There have been two separate studies of two versions of the Alcohol Misuse Prevention Program (Dielman et al., 1992; Dielman et al., 1989; Shope et al., 1992), which focuses on alcohol prevention; the strongest and most complete version is for students in grades 6 to 8. Evaluation of that program showed that among 121 high-risk sixth grade students (of 1,725 students in sample) who were already drinking at pretest (without parental supervision), there were significant reductions in misuse of alcohol. There were inconsistent results for students who had not been drinking at pretest. Minority students composed 5% of the sample (2% Black, 3% other ethnic group).

DARE

There have been four published studies of DARE (Clayton et al., 1991; Ennett, Rosenbaum, et al., 1994; Harmon, 1993; Ringwalt et al., 1991), the most widely used drug prevention approach in the United States. DARE is a K-12 program with a 17-session core curriculum in the fifth or sixth grade. DARE is implemented by uniformed police officers. Some studies show posttest reductions in tobacco, alcohol, and drug use that disappear shortly after the initial posttest. Other studies show no reductions in use. One of the most recent studies (Ennett, Rosenbaum, et al., 1994), a 2-year follow-up with 1,334 fifth and sixth graders, found 50% reduction in tobacco use for all students and 50% reductions in alcohol use for rural students at posttest, but effects disappeared by 1-year follow-up. Drug use was not measured. Minority students composed 46% of the sample of this study (22% Black, 9% Hispanic, 15% other ethnic group). Earlier studies also included substantial minority samples.

A major reason DARE may not have shown more consistent or lasting effects is that the core curriculum of DARE is usually delivered in fifth grade, when base rates of tobacco, alcohol, and drug use are low and effects hard to find. In addition, the DARE core curriculum has been revised to address criticisms concerning its content but has not yet been evaluated.

Growing Healthy

There has been one published evaluation study of Growing Healthy (Connell & Turner, 1985; Connell et al., 1985), a comprehensive health program consisting of 40 or more sessions per year for grades K-6. Approximately 30,000 fourth- to seventh-grade students were in the 2-year study, which looked at smoking behavior as an outcome. The program reduced smoking by 29% by ninth grade. Minority students composed 19% of the sample (15% Black, 2% Hispanic, 2% other ethnic group).

Know Your Body

There has been one published evaluation study of Know Your Body (Walter et al., 1989), a comprehensive health program with an average of 60 sessions per year for grades K-6. The sample included 1,105 fourth-grade students, who were followed 6 years. Evaluation results revealed smoking reductions of 73.3% at follow-up in ninth grade. There were greater reductions for males. No data were collected on alcohol or drugs. Minority students composed 19% of the sample (14% Black, 2% Hispanic, 5% other ethnic group).

Life Skills Training (LST)

The LST program, a broader personal and social skills training program for middle school students, designed to prevent tobacco, alcohol, and drug use, has been evaluated in 10 published studies (Botvin, Baker, Botvin, Filazzola, & Millman, 1984; Botvin, Baker, et al., 1995; Botvin, Baker, Dusenbury, et al., 1990; Botvin, Baker, Filazzola, & Botvin, 1990; Botvin, Batson, et al., 1989; Botvin, Dusenbury, et al., 1989; Botvin, Dusenbury, et al., 1992; Botvin & Eng, 1982; Botvin, Renick, & Baker, 1983; Botvin et al., 1994; Botvin, Schinke, et al., 1995). These studies have shown reductions of up to 50% to 75% in tobacco, alcohol, or marijuana use at seventh-grade posttest. A recent 6-year follow-up of 4,466 seventh-grade students showed that results erode only slightly by the end of high school, with 44% reductions in tobacco, alcohol, *or* marijuana use, and 66% reductions in use of all three: tobacco, alcohol, *and* marijuana use. Minority students composed at least 75% of the

sample in 4 of 10 separate studies; in each of these 4 studies, there was a combination of Blacks (11% to 87%) and Hispanics (10% to 74%).

Project Alert

There has been one published, 6-year evaluation of Project Alert (Bell et al., 1993; Ellickson & Bell, 1990; Ellickson et al., 1993), a social resistance skills training program for students in grades 6 and 7 or 7 and 8. Project Alert consists of 11 sessions in the first year and 3 in the second. There were 3,852 seventh-grade students in the evaluation study sample. Results showed immediate posttest reductions in drinking of up to 50%. In the second year of the study (in the 8th grade), there were declines in marijuana use of 33% to 60% and smoking reductions of 17% to 55%. All positive effects disappeared after 15 months. In addition, there were some negative effects for high-risk youth. Minority students composed 30% of the sample (10% Asian, 9% Hispanic, 8% Black, 3% other ethnic group).

Project Northland

There has been one published 3-year evaluation study of Project Northland (Perry et al., 1996), a social resistance skills training approach to alcohol prevention. Project Northland consists of eight sessions per year for grades 6 through 8. There were 1,901 sixth-grade students in the evaluation study sample. The program reduced the use of both alcohol and tobacco in the past month by 27% for all students. Those who did not use alcohol before the program showed declines of 50% in marijuana use and 37% in tobacco use. Minority students composed 5% of the sample (4% Native American, 1% other ethnic group).

Social Competence Promotion Program

There has been one published pretest-posttest study of the Social Competence Promotion Program, a 27-session social problem-solving program with a 9-session drug abuse prevention module (Caplan et al., 1992). A total of 282 sixth- and seventh-grade students were in the evaluation sample. At posttest, there were

reductions in frequent heavy alcohol use. Minority students composed 73% of the sample (66% Black, 6% Hispanic, 1% other ethnic group).

STAR

There has been one published 3-year study of Project STAR (Pentz et al., 1989; Pentz et al., 1990), an 18-session social resistance skills training approach for students in grades 5 through 8. There were 4,978 students in the evaluation study sample. Drinking, smoking, and marijuana use dropped 30% at 1-year follow-up; results persisted through the 3 years of the study. The evaluation study involved a multicomponent intervention (school curriculum, family program, and media spots), but variables were not manipulated to determine the contribution of each program component to overall effectiveness. The school-based program, however, did appear critical to success. Minority students composed 22% of the sample (17% Black, 2% Hispanic, 1% Asian, 2% other ethnic group).

Teenage Health Teaching Modules

There has been one published evaluation study of Teenage Health Teaching Modules (Errecart et al., 1991), a comprehensive health program with 40 to 70 sessions per year for grades 7 through 12. The evaluation, which included 4,806 junior and senior high school students in the sample, did not include follow-up beyond the posttest. Evaluation results revealed moderate reductions in alcohol, tobacco, and illegal drug use for senior high students. Minority students composed 26% of the sample (12% Hispanic, 10% Black, 3% Asian, 1% Native American).

Conclusion

On the basis of these evaluations, it appears that eight programs have been effective at reducing drug use, in at least some studies. At least one of the programs (LST) reviewed above has been shown in published reports to have effects into young adulthood. Six of these programs have been shown to have effects lasting for at least a year after the pretest. Two other programs have not been evaluated beyond the posttest, so it is impossible to know whether their

effectiveness will be lasting. In addition, one program (Project Alert) produced declines in drug abuse early on, but these effects diminished and disappeared through time. This does not necessarily mean that this program might not make an important contribution to drug abuse prevention, if done within the context of continuing prevention efforts. As discussed earlier, prevention programming must have adequate coverage and sufficient follow-up, which may not have been true for Project Alert and DARE. In addition, as mentioned above, in the case of DARE, the core curriculum takes place in the fifth grade, when the rate of substance use may well be too low to show effects.

Dissemination of the Most Promising Approaches

Despite considerable agreement among experts and in the literature about the critical ingredients of promising prevention curricula, most of the money spent in this country on drug education has not been spent on what evaluation studies suggest are the most promising programs. DARE, QUEST, and Here's Looking at You, 2000 are the three most widely used programs (Hansen et al., 1993). Other aggressively marketed programs include BABES, Project Charlie, Ombudsman, and Project Adventure. Of the aggressively marketed curricula, only DARE has been adequately evaluated. Although DARE has been extremely successful at diffusion and dissemination (R. Clayton, personal communication, 1994), evaluations reviewed above, as well as a recent meta-analysis (Ennett, Tobler, Ringwalt, & Flewelling, 1994), suggest that DARE is not consistently effective at reducing substance use behavior (Ennett, Rosenbaum, et al., 1994; Ennett, Tobler, et al., 1994; Ringwalt et al., 1991; Ringwalt et al., 1994).

Why are the most promising programs not more widely used? A key reason is that schools have received little guidance about how to select the most effective prevention program. Indeed, although there is a strong consensus among researchers about the types of prevention approaches that work, this information is often buried in highly technical journals and is not readily available beyond the research community.

Another major reason that the most promising programs have not been more widely disseminated is that they were usually developed

by researchers, who have not felt that it was appropriate in their role as evaluators of these programs to also promote them. Even when researchers may be motivated to disseminate their programs, they often lack necessary resources. In addition, when curricula are developed as part of research projects, researchers and universities both may claim an interest in these programs. Resolving these issues can delay dissemination indefinitely. Although tremendous energy and resources have gone into the development and evaluation of prevention programs, dissemination of these same programs has been largely neglected (Rohrbach, D'Onofrio, Backer, & Montgomery, 1996).

Policy Recommendations for *Healthy People 2010*

Research in drug abuse prevention is quite impressive, with a number of large field trials showing that prevention can have lasting effects. We now know quite a lot about what works in drug abuse prevention. *We therefore recommend that schools adopt curricula that include the key elements of effective drug abuse prevention; ideally, they should adopt curricula that have been rigorously evaluated.* Three major goals are related to this recommendation:

1. *All drug prevention curricula should be assessed to determine the extent to which each addresses the key elements of effective prevention, as in the guide* Making the Grade *(Drug Strategies, 1996).* Minimum criteria that should be considered when choosing a program include the following:

- Drug abuse prevention should provide students with social resistance skills training.
- Programs must also provide students with accurate information about drug-using norms. Almost half the programs we reviewed lacked a good normative education component. We encourage curriculum developers to address this weakness.
- Programs should include developmentally appropriate information about drugs.
- Interactive techniques promote the development of skills and are an important ingredient in drug abuse prevention.

- Programs should provide teachers with training and support. Because some teachers are less comfortable using interactive techniques than using didactic techniques, training in this area will be especially important.
- Programs should show a sensitivity to the culture(s) of students in the classroom. In our multiethnic society, virtually every classroom is a unique mix of ethnic and economic backgrounds. It is impossible for a nationally available curriculum to make itself culturally sensitive to every possible classroom. There are, however, ways in which curricula can help teachers make the best use of material. At a most basic level, curricula might use multiethnic names or models in materials, or they might be directly translated into another language. Programs need to go beyond this, however. They should provide teachers with detailed instructions in lessons about how to adapt curriculum material to make it most relevant and appropriate, depending on the culture(s) of students in their classes. Without such instruction, it is doubtful that all teachers will use curriculum materials to their best advantage for cultural sensitivity.
- To have any chance of being effective through time, programs should be sufficiently long and have adequate follow-up. Fewer than 10 sessions in a year and less than 3 years of follow-up may be too little, but there has not yet been much research to nail this down. Ideally, prevention programming should be continual. Students should receive prevention every year in school.
- Programs that provide training in broader personal and social skills are even more powerful in reducing drug use. Because these programs tend to be a bit longer, schools must consider how much time they can commit to drug abuse prevention. It is unwise to select any program if it is unlikely teachers will be able to teach all of it. Although some drug abuse prevention curricula acknowledge that teachers may choose to teach parts of their programs, we saw few that provided any real guidance about what parts are essential or nonessential. A program cannot be expected to work if teachers choose to teach different parts. If teachers or schools decide to start changing programs or leaving parts out, we have serious concerns about whether a curriculum would still be effective.
- School-based programs that include media, family, or community-based components are likely to be more effective than programs limited to classroom activities. Research will be needed to determine the relative contribution of different components to overall program effectiveness.

2. *All drug education curricula should be rigorously evaluated using pretest-posttest control group designs with measures of substance use behavior.* Program developers and marketers have a responsibility to determine the efficacy of the approaches they promote. *Healthy People 2000* includes as a service goal that all students receive prevention, preferably through quality comprehensive health education. Only three comprehensive health education programs had been rigorously evaluated, however, and only one included outcome measures of drug or alcohol use in addition to tobacco use. A future research objective of *Healthy People 2010* should be to adequately evaluate additional comprehensive health education programs.

3. *Drug prevention curricula demonstrated to be effective in research should be aggressively promoted.* Although there are questions about the lasting effectiveness of DARE, its success at dissemination deserves careful study to identify effective strategies. DARE provides a powerful example of how a curriculum can be effectively disseminated when community agencies and policymakers get behind a program and when mass marketing techniques are used. Part of the original success of DARE may be that it offered a concrete focus for the public and political energy generated by the Reagan administration's War on Drugs.

The staying power of DARE in the face of waning public attention, however, underscores the effectiveness of its dissemination strategy. The DARE example suggests important characteristics of programs that are likely to be used and institutionalized. DARE appears to have wide appeal for students and teachers (Ringwalt et al., 1994). Prevention coordinators report that curriculum materials such as videos, games, and even hand puppets can be particularly useful because they capture the attention of students. Programs that have been successfully mass-marketed tend to have developed more appealing curriculum materials, compared with programs that were developed in research laboratories. For example, in DARE, students enjoy the unusual opportunity to work with a police officer, and overworked teachers appreciate that someone else is responsible for delivering the program. The program also has many appealing extras, including a stuffed lion named DAREN, buttons, caps, bumper stickers, and so on.

We recommend that mechanisms be developed at the state and federal level to disseminate the most effective prevention programs. A simple step would be to identify interested curriculum publishers who can help researchers develop appealing program materials and who already have in place successful dissemination strategies such as presentations at education conferences and mass mailings. Researchers will also need help in resolving issues of ownership with their universities; federal clarification and guidelines concerning this issue would be helpful.

Conclusion

School-based drug education curricula represent one promising approach to the problem of adolescent drug abuse, although, by themselves, they are not enough. Public attention must be refocused on the problem of drug abuse to correct the current course toward increasing adolescent drug use. The family, the media, and the community as a whole must work with schools to promote anti-drug-using norms.

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